

The Claims

1. A dispensing tip for use with precision dispensing apparatus for delivering controlled amounts of viscous fluid to a selected location comprising:

- 5           a) a body having an inlet at one end adapted for connection in fluid communication with precision dispensing apparatus and having an outlet at another end of the body;
- 10           b) a fluid conducting passage in the body for connecting the inlet to the outlet, the passage having a first portion converging in a direction immediately from the inlet to an intermediate location in the body and a second portion of constant diameter extending from
- 15           the intermediate location to the outlet;
- c) so that the passage conducts fluid from the inlet to the outlet in a continuous and uninterrupted manner; and
- 20           d) wherein the body has a longitudinal axis and the first and second portions extend along the axis and wherein the diameter of a drop of viscous fluid leaving the outlet is directly proportional to the ratio of the axial length of the second portion to the axial length of
- 25           the first portion.

2. A dispensing tip according to claim 1, wherein the second portion of the passage has a diameter in a range from about 0.003 inch to about 0.030 inch.

3. A dispensing tip according to claim 1, wherein the body is of ceramic material.

4. A dispensing tip according to claim 1, wherein the body is of injection molded ceramic material.

5 5. A dispensing tip according to claim 1, wherein the body is of injection molded zirconia ceramic material.

6. A dispensing tip according to claim 1, further comprising a protective housing.

10 7. A dispensing tip according to claim 6, further including a standoff member extending from the housing for contacting a surface to which fluid is to be dispensed for spacing the outlet of the tip from the surface.

15 9. A dispensing tip for use with precision dispensing apparatus for delivering controlled amounts of fluid to a selected location comprising:

- 20 a) a body of ceramic material having an inlet at one end adapted for connection in fluid communication with precision dispensing apparatus and having an outlet at another end of the body; and
- 25 b) a fluid conducting passage in the body for connecting the inlet to the outlet, the passage being shaped to conduct fluid from the inlet to the outlet in a continuous and uninterrupted manner, said passage having a

portion converging in a direction immediately from the inlet and extending toward the outlet.

5 10. A dispensing tip according to claim 9, wherein the body is of injection molded ceramic material.

11. A dispensing tip according to claim 9, wherein the body is of injection molded zirconia ceramic material.

10 12. A dispensing tip according to claim 9, wherein the outlet has a diameter in the range from about 0.003 inch to about 0.030 inch.

13. A method of precision dispensing controlled amounts of fluid to a selected location comprising:

- 15 a) providing a dispensing tip having an inlet for receiving fluid from precision dispensing apparatus, an outlet for discharging fluid to the location and a passage between the inlet and outlet shaped to define a continuous and uninterrupted fluid flow from the inlet to the outlet;
- 20 b) introducing fluid to the inlet of the dispensing tip;
- c) funnelling the flow of fluid from the inlet toward the output;
- 25 d) transitioning the flow to a constant cross-section flow into the outlet; and
- e) discharging the fluid from the outlet to the location in a body of fluid having a dimension

in the range from about 0.003 inch to about  
0.030 inch.

14. A dispensing tip according to claim 9, in  
5 combination with a protective housing.

15. A dispensing tip according to claim 14,  
further including a standoff member extending from the  
housing for contacting a surface to which fluid is to be  
dispensed for spacing the outlet of the tip from the  
10 surface.

16. A dispensing tip according to claim 9, wherein  
the body has a longitudinal axis, the converging portion  
of the passage being a first passage portion, there  
being a second passage portion extending between the  
15 first passage portion and the outlet, the first and  
second passage portions extending along the axis and  
wherein the diameter of a drop of fluid leaving the  
outlet is directly proportional to the ratio of the  
axial length of the second passage portion to the axial  
20 length of the first passage portion.